

Amendment to the Claims:

Please amend the claims as follows:

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

Claims 1 to 7 (canceled)

Claim 8 (currently amended): A feed comprising a polypeptide having a phytase activity made by a method comprising the following steps:

(a) providing a nucleic acid isolated from an *E. coli*, or a synthetic or recombinant form of the nucleic acid isolated from the *E. coli* thereof, wherein the nucleic acid encodes a polypeptide having a phytase activity;

(b) providing a composition comprising a feed;

(c) expressing the nucleic acid under conditions which allow expression of the polypeptide having a phytase activity; and

(d) mixing the phytase of (c) with the composition of (b), thereby making a feed comprising a polypeptide having a phytase activity.

Claim 9 (previously presented): The feed of claim 8, wherein the nucleic acid is expressed by *in vitro* transcription.

Claim 10 (previously presented): The feed of claim 8, wherein the nucleic acid is expressed in a cell.

Claim 11 (previously presented): The feed of claim 10, wherein the nucleic acid is expressed in a yeast cell under conditions which allow expression of the enzyme in the yeast cell.

Claim 12 (currently amended): The feed of claim 8, wherein the polypeptide-encoding ~~phytase-encoding~~ nucleic acid comprises the sequence of:

a) SEQ ID NO:1; or

b) SEQ ID NO:1, wherein T is substituted with U; or

- c) SEQ ID NO:1 from nucleotide 1 to 1296; or
- d) SEQ ID NO:1 from nucleotide 1 to 1296, wherein T is substituted with U;  
or wherein the polypeptide having a phytase activity has the amino acid sequence of :
  - (i) SEQ ID NO:2; or
  - (ii) SEQ ID NO: 2 from amino acids 1 to 432.

Claim 13 (currently amended): A feed comprising a recombinant or a synthetic polypeptide having a phytase activity, wherein the recombinant polypeptide having a phytase activity is encoded by a nucleic acid isolated from an *E. coli*.

Claim 14 (currently amended): The feed of claim 13, wherein the polypeptide having a phytase activity is encoded by a nucleic acid having the sequence of :

- a) SEQ ID NO:1; or
- b) SEQ ID NO:1, wherein T is substituted with U; or
- c) SEQ ID NO:1 from nucleotide 1 to 1296; or
- d) SEQ ID NO:1 from nucleotide 1 to 1296, wherein T is substituted with U;  
or wherein the phytase having a phytase activity has the amino acid sequence of :
  - (i) SEQ ID NO:2; or
  - (ii) SEQ ID NO: 2 from amino acids 1 to 432.

Claim 15 (withdrawn – currently amended): A method for treating a feed comprising a polypeptide having a phytase activity to lower the phytate content in the feed and increasing the amount of inorganic phosphorous in the feed comprising the following steps:

- (a) providing a recombinant polypeptide having a phytase activity encoded by a nucleic acid isolated from an *E. coli*, or a synthetic or recombinant form of the nucleic acid isolated from the *E. coli* thereof;
- (b) providing a composition comprising a phytate-comprising feed;
- (c) contacting the polypeptide having a phytase activity of (a) with the composition of (b) under conditions wherein the polypeptide having a phytase activity catalyzes the hydrolysis of

phytate, thereby making a feed lower in phytate content and higher in inorganic phosphorous content.

Claim 16 (withdrawn - currently amended): The method of claim 15, wherein the polypeptide having a phytase activity is encoded by a nucleic acid having the sequence of in SEQ ID NO:1, or wherein the polypeptide having a phytase activity has the amino acid sequence of SEQ ID NO:2.

Claim 17 (withdrawn – currently amended): A method for supplementing the diet of an animal by increasing the amount of inorganic phosphorous in an ingested feed comprising feeding to the animal a composition comprising a recombinant phytase, wherein the recombinant phytase is encoded by a nucleic acid isolated from an *E. coli*, or a synthetic or recombinant form of the nucleic acid isolated from the *E. coli* thereof.

Claim 18 (withdrawn – currently amended): The method of claim 17, wherein the polypeptide having a phytase activity is encoded by a nucleic acid having the sequence of SEQ ID NO:1, or wherein the polypeptide having a phytase activity has the amino acid sequence of SEQ ID NO:2.

Claim 19 (currently amended): A food supplement for an animal comprising a composition comprising a recombinant polypeptide having a phytase activity, wherein the recombinant polypeptide having a phytase activity is encoded by a nucleic acid isolated from an *E. coli*, or a synthetic or recombinant form of the nucleic acid isolated from the *E. coli* thereof.

Claim 20 (currently amended): The food supplement of claim 19, wherein the polypeptide having a phytase activity is encoded by a nucleic acid having the sequence of :

- a) SEQ ID NO:1; or
- b) SEQ ID NO:1, wherein T is substituted with U; or
- c) SEQ ID NO:1 from nucleotide 1 to 1296; or
- d) SEQ ID NO:1 from nucleotide 1 to 1296, wherein T is substituted with U;

or wherein the polypeptide having a phytase activity has the amino acid sequence of :

- (i) SEQ ID NO:2; or
- (ii) SEQ ID NO: 2 from amino acids 1 to 432.

Claim 21 (previously presented): The food supplement of claim 20, wherein the nucleic acid is expressed in a plant cell and the plant cell is fed to the animal.

Claim 22 (previously presented): The food supplement of claim 21, wherein the plant cell is in a transgenic plant or plant part.

Claim 23 (previously presented): The food supplement of claim 19, wherein the composition is an aqueous liquid formulation or the composition further comprises an aqueous liquid formulation.

Claim 24 (currently amended): A drinkable foodstuff comprising a recombinant polypeptide having a phytase activity, wherein the recombinant polypeptide having a phytase activity is encoded by a nucleic acid isolated from an *E. coli*, or a synthetic or recombinant form of the nucleic acid isolated from the *E. coli* thereof.

Claim 25 (previously presented): The drinkable foodstuff of claim 24 comprising a liquor, a wine, a mixed alcoholic drink, a wine cooler, an alcoholic coffee, a beer, a near-beer, a juice, an extract, a homogenate or a puree.

Claim 26 (previously presented): The food supplement of claim 19, wherein the nucleic acid is expressed by *in vitro* transcription.

Claim 27 (previously presented): The feed of claim 10, wherein the cell is prokaryotic cell or a eukaryotic cell.

Claim 28 (previously presented): The feed of claim 10, wherein the cell is a bacterial cell, a yeast cell, a plant cell, an insect cell, a fungal cell or an animal cell.

Claim 29 (canceled)

Claim 30 (previously presented): The feed of claim 28, wherein the yeast cell is a *Saccharomyces cerevisiae*.

Claim 31 (previously presented): The feed of claim 28, wherein the bacterial cell is a gram negative bacteria or a gram positive bacteria.

Claim 32 (canceled)

Claim 33 (previously presented): The feed of claim 31, wherein the gram negative bacteria is an *Escherichia coli*.

Claim 34 (previously presented): The feed of claim 31, wherein the gram positive bacteria is a *Bacillus* sp.

Claim 35 (previously presented): The feed of claim 34, wherein gram positive bacteria is a *Bacillus subtilis*.

Claim 36 (previously presented): The feed of claim 28, wherein the fungal cell is an *Aspergillus* sp.

Claim 37 (previously presented): The feed of claim 36, wherein the fungal cell is an *Aspergillus terreus* or an *Aspergillus ficuum*.

Claim 38 (previously presented): The feed of claim 8, wherein the nucleic acid is contained in a cloning vehicle.

Claim 39 (previously presented): The feed of claim 38, wherein the cloning vehicle comprises an expression cassette, a vector, a plasmid, a phage, a phagemid, a cosmid, a fosmid, or an artificial chromosome, or, the cloning vehicle is an expression cassette, a vector, a plasmid, a phage, a phagemid, a cosmid, a fosmid or an artificial chromosome.

Claim 40 (previously presented): The feed of claim 10, wherein the polypeptide comprises a signal peptide (a leader sequence) and is secreted by the cell.

Claim 41 (previously presented): The feed of claim 8, wherein the *E. coli* is an *Escherichia coli* B.

Claims 42 to 43 (canceled)

Claim 44 (previously presented): The feed of claim 13, wherein the *E. coli* is an *Escherichia coli* B.

Claim 45 (canceled)

Claim 46 (previously presented): The food supplement of claim 19, wherein the *E. coli* is an *Escherichia coli* B.

Claim 47 (canceled)

Claim 48 (previously presented): The drinkable foodstuff of claim 24, wherein the *E. coli* is an *Escherichia coli* B.

Claim 49 (currently amended): The drinkable foodstuff of claim 24, wherein the polypeptide having a phytase activity is encoded by a nucleic acid having the sequence of :

a) SEQ ID NO:1; or

b) SEQ ID NO:1, wherein T is substituted with U; or

- c) SEQ ID NO:1 from nucleotide 1 to 1296; or
- d) SEQ ID NO:1 from nucleotide 1 to 1296, wherein T is substituted with U;  
or wherein the polypeptide having a phytase activity has the amino acid sequence of :
  - (i) SEQ ID NO:2; or
  - (ii) SEQ ID NO: 2 from amino acids 1 to 432.

Claim 50 (previously presented): The food supplement of claim 19, wherein the polypeptide-expressing phytase-expressing nucleic acid is expressed in a cell.

Claim 51 (currently amended): The food supplement of claim 50, wherein the nucleic acid is expressed in a yeast cell under conditions which allow expression of the polypeptide having a phytase activity in the yeast cell.

Claim 52 (previously presented): The food supplement of claim 50, wherein the polypeptide comprises a signal peptide (a leader sequence) and is secreted by the cell.

Claim 53 (currently amended): The food supplement of claim 19, wherein the polypeptide having a phytase activity lacks a signal peptide (a leader sequence).

Claim 54 (currently amended): The feed of claim 8, wherein the nucleic acid encodes a polypeptide having a phytase activity lacking a signal peptide (a leader sequence) and has a sequence of :

- a) SEQ ID NO:1, lacking the bases encoding amino acid residues 1 to 22; or
- b) SEQ ID NO:1, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22; or
- c) SEQ ID NO:1 from nucleotide 1 to 1296, lacking the bases encoding amino acid residues 1 to 22; or
- d) SEQ ID NO:1 from nucleotide 1 to 1296, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22;

or wherein the polypeptide having a phytase activity has the amino acid sequence of :

- (i) SEQ ID NO:2, and lacking amino acid residues 1 to 22; or
- (ii) SEQ ID NO: 2 from amino acids 1 to 432, and lacking amino acid residues 1 to 22.

Claim 55 (currently amended): The food supplement of claim 19, wherein the polypeptide having a phytase activity lacks a signal peptide (a leader sequence) and is encoded by a nucleic acid having the sequence of :

- a) SEQ ID NO:1, lacking the bases encoding amino acid residues 1 to 22; or
- b) SEQ ID NO:1, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22; or
- c) SEQ ID NO:1 from nucleotide 1 to 1296, lacking the bases encoding amino acid residues 1 to 22; or
- d) SEQ ID NO:1 from nucleotide 1 to 1296, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22;

or wherein the polypeptide having a phytase activity has the amino acid sequence of :

- (i) SEQ ID NO:2, and lacking amino acid residues 1 to 22; or
- (ii) SEQ ID NO: 2 from amino acids 1 to 432, and lacking amino acid residues 1 to 22.

Claim 56 (currently amended): The drinkable foodstuff of claim 24, wherein the polypeptide-expressing ~~phytase-expressing~~ nucleic acid is expressed in a cell.

Claim 57 (currently amended): The drinkable foodstuff of claim 56, wherein the polypeptide having a phytase activity comprises a signal peptide (a leader sequence) and is secreted by the cell.

Claim 58 (currently amended): The drinkable foodstuff of claim 24, wherein the recombinant polypeptide having a phytase activity lacks a signal peptide (a leader sequence) and is encoded by a nucleic acid having the sequence of :

- a) SEQ ID NO:1, lacking the bases encoding amino acid residues 1 to 22; or



b) SEQ ID NO:1, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22; or

c) SEQ ID NO:1 from nucleotide 1 to 1296, lacking the bases encoding amino acid residues 1 to 22; or

d) SEQ ID NO:1 from nucleotide 1 to 1296, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22;

or wherein the polypeptide having a phytase activity has the amino acid sequence of :

(i) SEQ ID NO:2, and lacking amino acid residues 1 to 22; or

(ii) SEQ ID NO: 2 from amino acids 1 to 432, and lacking amino acid residues 1 to 22.

Claim 59 (withdrawn – currently amended): A method for treating a feed comprising a polypeptide having a phytase activity to lower the phytate content in the feed and increasing the amount of inorganic phosphorous in the feed comprising the following steps:

(a) providing a recombinant polypeptide having a phytase activity (A) lacking a native signal peptide (a leader sequence), (B) lacking a native signal peptide (leader sequence) and comprising a heterologous signal peptide (leader sequence), (C) comprising (A) or (B) and a heterologous sequence; or (D) comprising (A), (B) or (C) and encoded by a polynucleotide comprising the nucleic acid of: (i) SEQ ID NO:1, lacking the bases encoding amino acid residues 1 to 22; (ii) SEQ ID NO:1, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22; (iii) SEQ ID NO:1 from nucleotide 1 to 1296, lacking the bases encoding amino acid residues 1 to 22; or (iv) SEQ ID NO:1 from nucleotide 1 to 1296, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22, or wherein the polypeptide has the amino acid sequence of : SEQ ID NO:2, and lacking amino acid residues 1 to 22, or SEQ ID NO: 2 from amino acids 1 to 432, and lacking amino acid residues 1 to 22;

(b) providing a composition comprising a phytate-comprising feed; and

(c) contacting the polypeptide having a phytase activity of (a) with the composition of (b) under conditions wherein the polypeptide having a phytase activity catalyzes the hydrolysis of

phytate, thereby making a feed lower in phytate content and higher in inorganic phosphorous content.

Claims 60 to 63 (canceled)

Claim 64 (previously presented): The food supplement of claim 19, wherein the animal is a nonhuman animal.

Claim 65 (canceled)

Claim 66 (currently amended): The feed of claim 13, wherein the nucleic acid encodes a polypeptide having a phytase activity lacking a signal peptide (a leader sequence) and has the sequence of :

- a) SEQ ID NO:1, lacking the bases encoding amino acid residues 1 to 22; or
  - b) SEQ ID NO:1, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22; or
  - c) SEQ ID NO:1 from nucleotide 1 to 1296, lacking the bases encoding amino acid residues 1 to 22; or
  - d) SEQ ID NO:1 from nucleotide 1 to 1296, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22;
- or wherein the polypeptide having a phytase activity has the amino acid sequence of :
- (i) SEQ ID NO:2, and lacking amino acid residues 1 to 22; or
  - (ii) SEQ ID NO: 2 from amino acids 1 to 432, and lacking amino acid residues 1 to 22.

Claim 67 (currently amended): The feed of claim 8, wherein the polypeptide having a phytase activity comprises [[a]] an amino acid sequence

- (a) lacking a homologous (native) signal peptide (a leader sequence),

(b) lacking a homologous (native) signal peptide (leader sequence) and further comprising a heterologous signal peptide (leader sequence), or

(c) comprising (a) or (b) and further comprising a heterologous sequence, or

(d) comprising the amino acid sequence of (a), (b) or (c) [[and]] encoded by a polynucleotide comprising the nucleic acid of: (i) SEQ ID NO:1, lacking the bases encoding amino acid residues 1 to 22; (ii) SEQ ID NO:1, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22; (iii) SEQ ID NO:1 from nucleotide 1 to 1296, lacking the bases encoding amino acid residues 1 to 22; or (iv) SEQ ID NO:1 from nucleotide 1 to 1296, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22, or wherein the polypeptide having a phytase activity has the amino acid sequence of: SEQ ID NO:2, and lacking amino acid residues 1 to 22, or SEQ ID NO: 2 from amino acids 1 to 432, and lacking amino acid residues 1 to 22.

Claim 68 (currently amended): The feed of claim 13, wherein the polypeptide having a phytase activity comprises [[a]] an amino acid sequence

(a) lacking a homologous (native) signal peptide (a leader sequence),

(b) lacking a homologous (native) signal peptide (leader sequence) and further comprising a heterologous signal peptide (leader sequence), or

(c) comprising (a) or (b) and further comprising a heterologous sequence, or

(d) comprising the amino acid sequence of (a), (b) or (c) [[and]] encoded by a polynucleotide comprising the nucleic acid of: (i) SEQ ID NO:1, lacking the bases encoding amino acid residues 1 to 22; (ii) SEQ ID NO:1, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22; (iii) SEQ ID NO:1 from nucleotide 1 to 1296, lacking the bases encoding amino acid residues 1 to 22; or (iv) SEQ ID NO:1 from nucleotide 1 to 1296, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22, or wherein the polypeptide having a phytase activity has the amino acid sequence of: SEQ ID NO:2, and lacking

amino acid residues 1 to 22, or SEQ ID NO: 2 from amino acids 1 to 432, and lacking amino acid residues 1 to 22.

Claim 69 (withdrawn – currently amended): The method of claim 15, wherein the polypeptide having a phytase activity comprises [[a]] an amino acid sequence

(a) lacking a homologous (native) signal peptide (a leader sequence),  
(b) lacking a homologous (native) signal peptide (leader sequence) and further comprising a heterologous signal peptide (leader sequence), or  
(c) comprising (a) or (b) and further comprising a heterologous sequence, or  
(d) comprising the amino acid sequence of (a), (b) or (c) [[and]] encoded by a polynucleotide comprising the nucleic acid of: (i) SEQ ID NO:1, lacking the bases encoding amino acid residues 1 to 22; (ii) SEQ ID NO:1, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22; (iii) SEQ ID NO:1 from nucleotide 1 to 1296, lacking the bases encoding amino acid residues 1 to 22; or (iv) SEQ ID NO:1 from nucleotide 1 to 1296, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22, or wherein the polypeptide having a phytase activity has the amino acid sequence of: SEQ ID NO:2, and lacking amino acid residues 1 to 22, or SEQ ID NO: 2 from amino acids 1 to 432, and lacking amino acid residues 1 to 22.

Claim 70 (withdrawn – currently amended): The method of claim 17, wherein the polypeptide having a phytase activity comprises [[a]] an amino acid sequence

(a) lacking a homologous (native) signal peptide (a leader sequence),  
(b) lacking a homologous (native) signal peptide (leader sequence) and further comprising a heterologous signal peptide (leader sequence), or  
(c) comprising (a) or (b) and further comprising a heterologous sequence, or

(d) comprising the amino acid sequence of (a), (b) or (c) [[and]] encoded by a polynucleotide comprising the nucleic acid of: (i) SEQ ID NO:1, lacking the bases encoding amino acid residues 1 to 22; (ii) SEQ ID NO:1, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22; (iii) SEQ ID NO:1 from nucleotide 1 to 1296, lacking the bases encoding amino acid residues 1 to 22; or (iv) SEQ ID NO:1 from nucleotide 1 to 1296, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22, or wherein the polypeptide having a phytase activity has the amino acid sequence of: SEQ ID NO:2, and lacking amino acid residues 1 to 22, or SEQ ID NO: 2 from amino acids 1 to 432, and lacking amino acid residues 1 to 22.

Claim 71 (currently amended): The food supplement of claim 19, wherein the polypeptide having a phytase activity comprises [[a]] an amino acid sequence

(a) lacking a homologous (native) signal peptide (a leader sequence),  
(b) lacking a homologous (native) signal peptide (leader sequence) and further comprising a heterologous signal peptide (leader sequence), or  
(c) comprising (a) or (b) and further comprising a heterologous sequence, or  
(d) comprising the amino acid sequence of (a), (b) or (c) [[and]] encoded by a polynucleotide comprising the nucleic acid of: (i) SEQ ID NO:1, lacking the bases encoding amino acid residues 1 to 22; (ii) SEQ ID NO:1, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22; (iii) SEQ ID NO:1 from nucleotide 1 to 1296, lacking the bases encoding amino acid residues 1 to 22; or (iv) SEQ ID NO:1 from nucleotide 1 to 1296, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22, or wherein the polypeptide having a phytase activity has the amino acid sequence of: SEQ ID NO:2, and lacking amino acid residues 1 to 22, or SEQ ID NO: 2 from amino acids 1 to 432, and lacking amino acid residues 1 to 22.

Claim 72 (currently amended): The drinkable foodstuff of claim 24, wherein the polypeptide having a phytase activity comprises [[a]] an amino acid sequence

- (a) lacking a homologous (native) signal peptide (a leader sequence),
- (b) lacking a homologous (native) signal peptide (leader sequence) and further comprising a heterologous signal peptide (leader sequence),
- (c) comprising (a) or (b) and further comprising a heterologous sequence, or
- (d) comprising the amino acid sequence of (a), (b) or (c) [[and]] encoded by a polynucleotide comprising the nucleic acid of: (i) SEQ ID NO:1, lacking the bases encoding amino acid residues 1 to 22; (ii) SEQ ID NO:1, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22; (iii) SEQ ID NO:1 from nucleotide 1 to 1296, lacking the bases encoding amino acid residues 1 to 22; or (iv) SEQ ID NO:1 from nucleotide 1 to 1296, wherein T is substituted with U, lacking the bases encoding amino acid residues 1 to 22, or wherein the polypeptide having a phytase activity has the amino acid sequence of: SEQ ID NO:2, and lacking amino acid residues 1 to 22, or SEQ ID NO: 2 from amino acids 1 to 432, and lacking amino acid residues 1 to 22.